4866

[redacted]

Diag. Cht. No. 4000

4866

[redacted]

Form 504

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

....., *Director*

State: Hawaiian Is.

DESCRIPTIVE REPORT

~~*Topographic*~~
Hydrographic } *Sheet No.* 4866

LOCALITY

French Frigate Shoals

East Side of Shoals

192 8

CHIEF OF PARTY

K.T. Adams

GOVERNMENT PRINTING OFFICE

Form 537
11—5812

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

[redacted]

HYDROGRAPHIC TITLE SHEET

[redacted]

REG. NO. 4866

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

Field No. 10

REGISTER NO. 4866

State Territory of Hawaii

General locality French Frigate Shoals, T.H.

Locality East Side of Shoals

Scale 1:40,000 Date of survey August 3 to Sept. 29, 1928.

Vessel Ship GUIDE

Chief of Party K.T.Adams

Surveyed by Ship's Compliment

Protracted by F.L.Gallen, V.M.Gibbens, G.W.Lovesee

Soundings penciled by W.H.Bainbridge

Soundings in fathoms ~~-feet~~

Plane of reference M.L.L.W.

Subdivision of wire dragged areas by

Inked by J. Fleming

Verified by J.F. Jan 16-1930

Instructions dated March 25, 1928.

Remarks: The work on this sheet is included in 4 sounding volumes, Forwarded with the sheet is the Descriptive Report, Report for the Verifier, Velocity Correction Tables, Slope Factor Tables, the Tidal Data to be forwarded at a later date.

GPO

DECLASSIFIED BY NOAA
PURSUANT TO DOC SYSTEMATIC REVIEW
GUIDELINES AS DESCRIBED IN SECTION
3.3(a), EXECUTIVE ORDER 12356.

DEPARTMENT OF COMMERCE
U.S. COAST & GEODETIC SURVEY,
E.Lester Jones, Director

DESCRIPTIVE REPORT
to accompany
HYDROGRAPHIC SHEET NO.10 4866
French Frigate Shoals, T.H.

Steamer GUIDE

K. T. Adams
Chief of Party.

DESCRIPTIVE REPORT
to accompany
HYDROGRAPHIC REPORT NO.10
French Frigate Shoals, T. H.

1. DATE OF INSTRUCTIONS:

This hydrographic sheet has been done in compliance with instructions from the Director, dated March 28, 1928, and is part of the survey of French Frigate Shoals.

2. LIMITS:

This sheet, together with Hydrographic Sheet No. 11, is a survey outside of the great barrier reef, from comparatively shoal water out to the 1000 fathom curve, except to the east, where a bank extends beyond the limits of local control. This sheet makes a junction with this party's sheets Nos. 11, 12 and 8.

3. SURVEY METHODS:

The Fathometer was used almost exclusively on this sheet, the exceptions being a few lines in hand-lead depth, and a few lines of tube soundings on days when the Fathometer was inoperative.

Some trouble was encountered in making the Fathometer give correct soundings, it seeming to depend on various adjustments of the relay. These discrepancies were corrected as well as possible in the records and on the smooth sheet, to give correct values.

With the "red light" working, my rule was to obtain "red light" soundings to at least 200 fathoms before using the "white l light" soundings, and in general no trouble was encountered in getting this depth and sometimes up to 300 fathoms. However, during the period when the "red light" was inoperative, "white light" soundings were taken into what were supposed to be tube depths. Later it was discovered that these soundings were consistently too deep. Apparently when the echo is so close to the firect signal there is a tendency to read the "white light" too deep. This tendency gradually disappears as the water gets deeper. On the smooth sheet, where soundings overlap, the tube soundings or the "red light" soundings are used and the "white light" soundings rejected or adjusted to fit. Whenever possible, in reading the "white light", the double echo or some other multiple of the echo was read and the correct fraction recorded. This method reduces the error of reading. Unfortunately, in the shoaler depths, no more than the first echo was generally to be heard.

The outer barrier reef, where not located by the launch, was located as follows: It was possible for the ship to obtain three point fixed positions, whereas the launch could not see signals. Therefor a line was run around the reef, the ship keeping in approximately ten fathoms, with the launch always inside in about five

fathoms. On each ship's position a vertical angle was taken to that point of the reef in range with Station PIN, also a vertical angle to the launch and a horizontal angle to the launch. This located both the reef and launch. The launch also located the reef. At times the reef was indefinite, but in general a close location was obtained.

4. CONTROL:

A great part of this sheet was controlled by visual, three point fixes, some of them became comparatively weak at times however. These lines were mostly run parallel to the reef and at increasing distances from it, due to the fact that this vessel returned to an anchorage each night for the detached parties.

However, outside the limit of visual fixes, radial lines were run in loops beginning with a three point fix and ending in one; the full speed loops being adjusted to these positions.

5. DISCREPANCIES:

Various discrepancies have been discussed above in paragraph 3, but all have been adjusted by our party in the field, they having more knowledge of the actual circumstances under which the discrepancies occured.

6. DANGERS:

There are no dangers within the limits of this sheet, except the reef itself, which can be plainly seen in the daytime for a considerable distance. The reef is practically always breaking, and the few times it is not the green shoal water inside the reef is seen in plenty of time to avoid danger. The depth slopes off continuously from the reef to the thousand fathom curve.

STATISTICS FOR HYDROGRAPHIC SHEET, FIELD NO. 10.
French Frigate Shoals, T. H.

Date	Day Letter	Volume.	STATUTE MI. OF SOUNDINGS Hand Lead	Tubes	Fathometer Red Light	Fathometer White Light	NUMBER OF SOUNDINGS Hand Lead or V.C.	Tubes	Fath. White Light	Positions	Boat Used
1928											
Aug. 3	A	1			14.9				1	17	Ship
" 8	B	1	10.1		30.1		146			90	"
" 9	C	1	0.7		41.9		9			73	"
10	D	1			55.7		1		6	92	"
" 13	E	2			40.0	13.2			29	85	"
Sept. 8	F	2			11.3					23	"
" 14	G	2				5.7			59	31	"
" 15	H	2				40.5			131	69	"
" 16	J	2	24.1				240			48	"
" 19	K	2	[illegible]			67.2			274	115	"
" 21	L	2		3.9				34		14	"
" 21	L	3		22.7				132		37	"
" 26	M	3			75.0	22.0			72	162	"
" 28	N	3			7.3	48.5			139	83	"
" 29	P	3			34.7	21.6			59	82	"
" 16	j	"Launch"	23.8				393			59	Launch
TOTALS	15	4	58.7	26.6	310.9	218.7	789	166	767	1080	

TOTAL STATUTE MILES 614.9 TOTAL SOUNDINGS 1722

TIDAL NOTE

SHEET # 10,
French Frigate Shoals, T. H.
1928

A portable-automatic tide gauge was established on the edge of the reef at the south-east end of East Island, lat. 23 - 46.96 N, 166 - 12.53 W.

Simultaneous Comparisons were made with Honolulu tides for the periods July 11 - 16, August 5 - 21, September 9 - 15 and September 19 - 25, inclusive.

These gave a value of MLLW = 3.12 on the staff at French Frigate Shoals. An independent determination of MLLW gave a value of 3.04. The value MLLW = 3.1 was used for reduction of soundings.

For days when French Frigate Shoals tides were not available, Honolulu tides were used with time 21 minutes earlier and range 0.73, as determined by the Simultaneous Comparison.

A summary of tides used is as follows:

French Frigate Shoals

B	day,	August	8
C	"	"	9
D	"	"	10
E	"	"	13
G	"	Sept.	14
H	"	"	15
J	"	"	16
K	"	"	19
L	"	"	21
j	"	"	16

Honolulu

A	day,	August	3
F	"	Sept.	8
M	"	"	26
N	"	"	28
P	"	"	29

Section of Field Records.

Ecm

August 23, 1929.

Division of Hydrography and Topography:

✓ Division of Charts:

Tide Reducers are approved in
4 volumes of sounding records for

HYDROGRAPHIC SHEET 4866

Locality: French Frigate Shoals, T. H.

Chief of Party: K. T. Adams in 1928
Plane of reference is mean lower low water, reading
3.1 ft. on tide staff at East Islands, French Frigate Shoals
~~ft. below B. M.~~

Condition of records satisfactory except as checked below:

1. Locality and sublocality of survey omitted.
2. Month and day of month omitted.
3. Time meridian not given at beginning of day's work.
4. Time (whether A.M. or P.M.) not given at beginning of day's work.
5. Soundings (whether in feet or fathoms) not clearly shown in record.
6. Leadline correction entered in wrong column.
7. Field reductions entered in "Office" column.
8. Location of tide gauge not given at beginning of day's work.
9. Leadline corrections not clearly stated.
10. Kind of sounding tube used not stated.
11. Sounding tube No. entered in column of "Soundings" instead of "Remarks".
12. Legibility of record could be improved.
13. Remarks.

H. A. Marmer

Chief, Division of Tides and Currents.

Section Field Records

Report on H. 4866 — Surveyed in 1928

Chief of Party K.T. Adams. — Surveyed by Ship's survey party

Protracted by — F.L. Gallen, V.M. Gilbert, G.W. Fowler

Soundings by — W.L. Bainbridge

Verified and inked — J. Fleming

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(1) The records conform to the requirements of G.D.

(2) The plan and character of the development fulfill the requirements of G.D.

(3) Sounding line crossings are adequate

(4) The usual depth curves can be completely drawn

(5) The field plotting was completed to the extent prescribed in G.D.

(6) With the exception of the alteration of soundings lines between Positions 31 (Vol-4) to 33-J and between 32 Vol-2 to 34-J and the loop lines at 72-N and 31-P and the correction of such soundings as $4\frac{3}{4}$ fathoms $9\frac{5}{6}$ fathoms none of the work had to be done over

In a number of soundings below 10 fathoms when the final values were fathoms and ~~thenths~~ tenths The tenths were often dropped by the field plotter. The reef as shown on this sheet was plotted in the office from the data given in the sounding Volumes Faint needle point pricks on the smooth sheet indicated that this had been done in the field but the uncertainty made it necessary to replot it in the office

In the attempt to account for the consistent differences between the plotted courses and the courses given in the records with the proper corrections applied a tracing of the ships courses as plotted on the boat sheet was placed over the smooth sheet.

It should be stated that a tracing of the loop lines only was made.

There appeared to be close agreement between them except at 72-N and 31-P (Sat. - 23°-54') and the difference was accounted for by the application of the log and time scale.

Good agreement was obtained between the log distance in the record and the corresponding distances on the sheet and the error at the first 3-point fix coming in, was not more than would be due to a variation of the amount allowed for leeway.

On B-C-D&E days the sounding interval was not uniform and quite a number of soundings had to be replotted

In approx. Sat. 23°-34'-30" Long. 166-04'-00" are two soundings of 687 fathoms and 840 fathoms. It was thought that the slope factor used was too low but investigation showed that the value used was correct.

The few bottom characteristics given in the records were all placed on the sheet.

The meteric distances given under remarks on F day are not stated specifically to apply to the reef but the fact that the wavy inked line on the boat sheet corresponds to a line drawn thru the plotted points of the distances given on F-day is thought to be sufficient to deduce that the reef was implied.

Attention is called to the fact that the south end of the reef is plotted using the data of F-day The data of J day and the launch data relating

~~to the~~ to the position of the reef line were rejected owing to the fact that such data as applied to the southern end of the reef plots some distance further to the N.W.

— Note that position 59-j at the reef end has been replotted in a new position 130-meters from the field plotted position in a S.E direction

Observe that pos. 33 J vol. #2 contains a reference to an opening in the reef in line with ΔPIN It was thought proper to indicate this in the manner shown but before doing so, it was found that 33-J was out 160-meters. The replotting caused the line to straighten out.

Note Tide rips in this vicinity (33-J)
Note also 'Breakers' 300-m. SE of Pos 43-J (Vol #2)
This would place these near the Tide rips.

It is desired to call attention to the fact that that by the time the end of the line was reached on J day the difference in time amounted to 2-Minutes. The Launch clock being 2--Minutes slower than the ship clock This variable difference was considered in the checking.

The work is considered 'Very Good'

Respectfully submitted
John Fleming

Jan-17-1930

IN REPLY ADDRESS THE DIRECTOR
U. S. COAST AND GEODETIC SURVEY
AND NOT THE SIGNER OF THIS LETTER

AND REFER TO No. 11-WSW

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
WASHINGTON

August 25, 1930.

SECTION OF FIELD RECORDS

Report on Hydrographic Sheet No. 4866

East Side of French Frigate Shoals, Territory of Hawaii

Surveyed in 1928

Instructions dated March 26, 1928 (Guide)

Fathometer, tube and Hand lead soundings

Chief of Party, K. T. Adams.

Surveyed by K.T.Adams, F.L.Gallen, H.C.Warwick and F.B.Quinn.

Protracted by F.L.Gallen, V. M. Gibbens, G. W. Lovesee.

Soundings plotted by W. H. Bainbridge.

Verified and inked by J. Fleming.

1. The records conform to the requirements.

2. The plan, character and extent of the survey satisfy the general and specific instructions, except that the fathometer was occasionally used in depths under ten fathoms. (Position 51 D to Position 52D)

3. The sounding lines cross fairly well.

4. The information is sufficient for completely drawing the usual depth curves except in the shoal areas close to the reef.

5. The junction with H. 4901, south of Lat. 23° 52', Long. 166° 21' is satisfactory but the depths do not agree very well. As H. 4901 is not completed this junction will be reported in the review of that sheet.

   a. While the junction with H. 4871 was examined and is thought to be satisfactory, this sheet is not completed and the junction will be reported in the review of that sheet.

   b. H. 4902 joins this sheet on the other side of the reef. One line on H. 4902 actually passed over the reef in the vicinity of Lat 23° 45', Long. 166° 04'.

c. The junction with H. 4867, in the vicinity of Lat. 23° 37', is satisfactory.

6. The usual amount of field plotting was fairly well done by the field party. Fractions of a fathom were not always expressed correctly and tenths of a fathom, on fathometer soundings under ten fathoms were ignored.

a. The reef as shown on the sheet was plotted in the office from the distances computed from vertical angles from ship positions. On the southern portion, the reef was located from both J day and F day. The position as determined on F day was accepted as correct, as this line had been inked on the boatsheet while the other line was left in pencil.

7. Character and scope of surveying --- good.

With the exception of a few lines of tube soundings and a few lines in hand-lead depths, all of the soundings on this sheet were obtained with the Fathometer. When possible the "red light" method was used to a depth of 200 fathoms or greater. However, when the "red light" was inoperative, "white light" soundings were taken in fairly shoal depths.

a. These soundings are apparently too deep and have been rejected where they failed to check tube soundings or "red light" soundings on the smooth sheet. The adjustment of fathometer soundings by the field party has been accepted and only a few isolated "white light" soundings were rejected in the office.

b. There are no dangers or unusual features within the limits of this work except the reef itself.

8. No additional work is necessary.

9. Reviewed by R. L. Johnston, May 14, 1930.

Approved:

A. M. Sobieralski

Chief, Section of Field Records (CHARTS)

F. P. Gordon

Chief, Section of Field Work (H. & T.)

Ens. W. Paynter ch. asst. charts

IN REPLY ADDRESS THE DIRECTOR
U. S. COAST AND GEODETIC SURVEY
AND NOT THE SIGNER OF THIS LETTER

AND REFER TO No. 11-WSW

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
WASHINGTON

August 25, 1930.

SECTION OF FIELD RECORDS

Report on Hydrographic Sheet No. 4866

East Side of French Frigate Shoals, Territory of Hawaii

Surveyed in 1928

Instructions dated March 26, 1928 (Guide)

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b. There are no dangers or unusual features within the limits of this work except the reef itself.

8. No additional work is necessary.

9. Reviewed by R. L. Johnston, May 14, 1930.

Approved:

Chief, Section of Field Records (CHARTS)

Chief, Section of Field Work (H. & T.)

Field Records Section (Charts)

HYDROGRAPHIC SHEET No. 4866

The following statistics will be submitted with the cartographer's report on the sheet:

Number of positions on sheet	1080
Number of positions checked	244
Number of positions revised	15
Number of soundings recorded	1722
Number of soundings revised	71
Number of signals erroneously plotted or transferred	

Date: Jan. 18 1930

Cartographer: John Fleming

Applied to Chart 4182 8/6/40 CRBJr

Applied to Chart 4182 Aug 2. 1946 [illegible]